



Proposed Plan for a Cleanup of Pit 9 at the Radioactive Waste Management Complex, Idaho National Engineering Laboratory

Introduction

This Proposed Plan identifies the preferred interim action (see glossary) alternative for a cleanup of Pit 9 at the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering Laboratory (INEL). In addition, this Plan includes summaries of other interim action alternatives for Pit 9. The purpose of this interim action is to reduce the potential of external exposure and inhalation hazards to workers, and to expedite overall cleanup at the RWMC. Interim actions can be taken to respond to an immediate site threat or, as in the case of Pit 9, to take advantage of an opportunity to significantly reduce risk quickly. Interim actions are generally followed by other cleanup activities to provide long-term protection of human health and the environment. The Pit 9 interim action will be compatible with other long-term cleanup activities being conducted at the INEL.

This Proposed Plan is submitted in accordance with the public participation requirements under Section 117(a) of CERCLA. The Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Idaho Department of Health and Welfare (IDHW), hereafter called "the Agencies", are seeking comments from the public on all of the alternatives identified in this Proposed Plan, not just the preferred alternative. The actual remedy selected may be the preferred alternative, a modification of such, a combination of elements from some or all of the alternatives, or another identified interim action alternative. The alternative to be used to cleanup Pit 9 will not be selected until the public comment period has ended and all comments have been received and considered. This interim action will comply with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, the Superfund law), and the Hazardous Waste Management Act (HWMA, Idaho's hazardous waste law).

Public Comment Period

**December 13, 1991
through
January 12, 1992**

How you can participate - The public is encouraged to participate in the remedy selection process. You can participate by reading this Proposed Plan, reading additional documents in the Administrative Record (information used to select a remedy) by visiting one of the information repositories listed on page 8, and attending the public meeting listed on the last page. Written and verbal comments are given equal consideration and can be submitted to Jerry Lyle at the address listed on page 10. All comments and the meeting transcript will become part of the Administrative Record and will be responded to in a Responsiveness Summary which will be jointly prepared by DOE, EPA and IDHW. If you have questions concerning the Proposed Plan or other INEL issues, please contact the INEL Community Relations Office at the address listed on page 10.

Site Background

The INEL is an 890 square mile federal facility operated by DOE, whose primary missions are nuclear reactor technology development and waste management. In November 1989, the INEL was placed on the CERCLA National Priorities List (NPL) because releases of hazardous substances have occurred which may pose a risk to human health and the environment.

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The RWMC is located in the southwestern portion of the INEL (see map at right). Pit 9 is located in the northeast corner of the Subsurface Disposal Area (SDA) at the RWMC, and cannot be easily identified from the surface since soil was placed over what was once a waste pit (see map below).

The inventory of wastes buried within Pit 9 was estimated from available shipping records and the Radioactive Waste Management Information System (RWMIS) (see map on next page). The waste within Pit 9 is primarily waste contaminated with transuranic isotopes (see glossary) of americium and plutonium generated at the Rocky Flats Plant, which includes some nonradioactive hazardous constituents. Some additional wastes (primarily radioactive waste) generated at the INEL were also buried within Pit 9.

Approximately 110,000 ft³ of the waste buried in Pit 9 was generated at the Rocky Flats Plant, and consisted of drums of sludge, drums of assorted solid waste, and cardboard boxes containing empty contaminated drums. There were an estimated 4,000 drums; 2,500 boxes (approximately 1,500 of which contained empty contaminated drums); and 80 unspecified containers of waste buried within Pit 9. In general, the boxes were disposed at the north end of the pit, and the drums were disposed in the south end, although intermixing of containers in the pit did occur. Flooding occurred in 1969 while Pit 9 was still an active waste disposal pit, which may have created additional intermixing. In addition, large metal

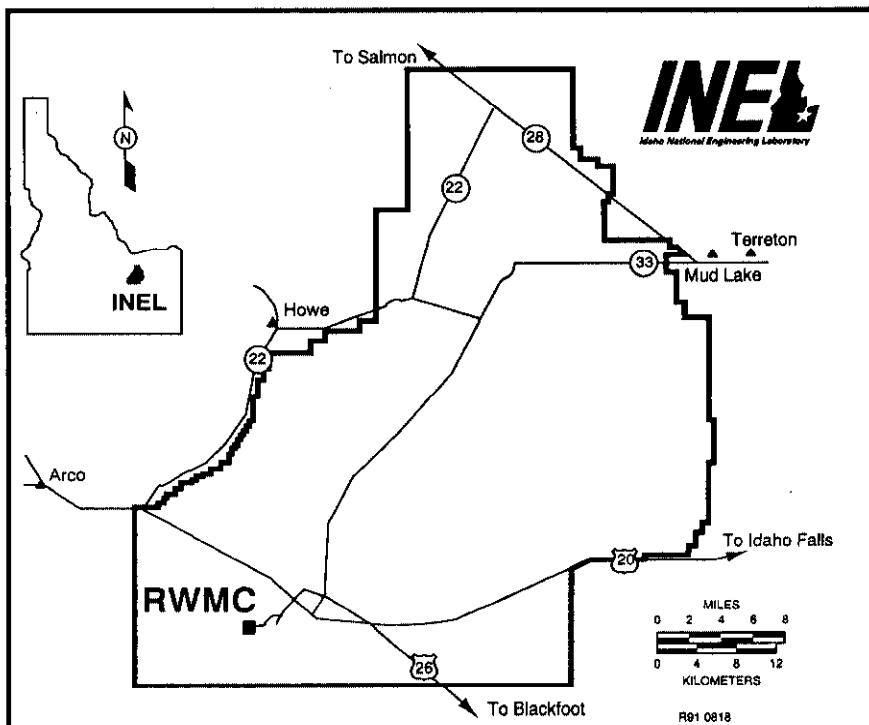
objects may have been disposed north of the transuranic drums.

Scope and Role of This Interim Action

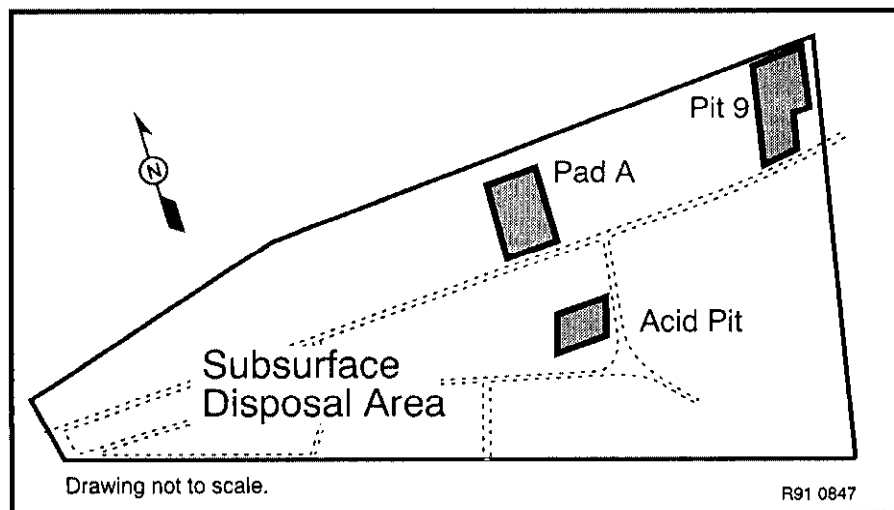
To better manage the investigations needed to determine appropriate remedial actions, the INEL has been divided into 10 waste area groups (WAGs). Each WAG is in turn

divided into operable units to make characterization and cleanup activities easier to manage and to expedite overall site cleanup. Many of the operable units at the INEL are currently planned to be interim actions. This strategy allows the Agencies to focus available cleanup resources on those areas which could potentially pose the greatest risk to the INEL workers, public health and the environment. Under this current strategy the RWMC has been designated WAG 7. Pit 9, which has been designated Operable Unit 7-10, is located within this WAG.

A schedule for the characterization and cleanup of each operable unit is



The Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering Laboratory (INEL)



Pit 9 located within the Subsurface Disposal Area (SDA) at the RWMC

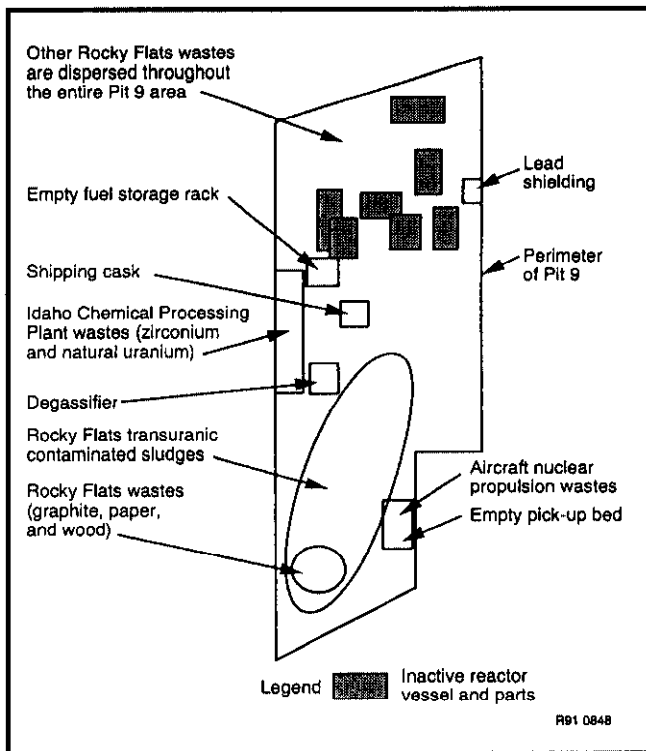
located within the INEL Federal Facilities Agreement/ Consent Order (FFA/CO) and Action Plan, documents which have been negotiated between the Agencies. These documents contain procedures and processes designed to ensure that cleanups at the INEL will be conducted in accordance with State and Federal environmental laws. The final cleanup action for Pit 9 remediation will be addressed in the Remedial Investigation/ Feasibility Study (RI/FS) for the TRU Contaminated Pits And Trenches (OU 7-13), scheduled to be completed in 1997. By starting the interim action process now, cleanup activity on Pit 9 will begin much earlier than if it followed the RI/FS.

Summary of Site Risks

A Preliminary Risk Evaluation (see box next page) was conducted to identify the potentially significant risks to human health and the environment if Pit 9 was not cleaned up. Historical records indicate that Pit 9 contains radioactive and nonradioactive contaminants. The radioactive contaminants include: americium, plutonium, barium, cobalt, cesium, strontium, thorium, uranium, and yttrium. The nonradioactive contaminants include: asbestos, beryllium, calcium silicate, lead, lithium, mercury, potassium nitrate, sodium nitrate, carbon tetrachloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, and zirconium.

Three types of worker exposure were evaluated for noncarcinogenic and carcinogenic risks as a part of the human health risk evaluation: inhalation of contaminated soil, external exposure to radiation, and ingestion of contaminated soil. Noncarcinogenic effects were evaluated by comparing the estimate of intake of the contaminant with acceptable levels. If the contaminant concentration at the site exceeds acceptable levels then there may be a concern for noncarcinogenic effects. This risk evaluation identified the americium and plutonium radionuclides as posing the greatest carcinogenic risk. Carcinogenic effects were evaluated to determine the potential increase in cancer deaths due to contaminants. As described in the National Contingency Plan (NCP), an excess cancer risk in the range of 1 chance in 10,000 to 1 chance in 1,000,000 is considered to be a maximum acceptable range of risks. Using EPA exposure guidelines, inhalation of particulates with americium and plutonium present would result in an excess cancer risk of 1 out of 25. The risk associated with direct external exposure from americium would result in an excess cancer risk of 1 out of 3.

The final results of the Preliminary Risk Evaluation indicate a need to conduct an interim action, with the predominant risk drivers being americium and plutonium. Additional information on the Preliminary Risk Evaluation for Pit 9 is in the Administrative Record. Threatened releases of americium and plutonium from this site, if not addressed by



Pit 9 waste distribution based on historical records.

the preferred alternative or one of the other alternatives considered, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

Summary of Alternatives

The interim action alternatives evaluated as a cleanup of Pit 9 are the following:

- Alternative 1 - No Action**
- Alternative 2 - In-Situ Vitrification**
- Alternative 3 - Ex-Situ Vitrification**
- Alternative 4 - Chemical Extraction and/or Physical Separation**
- Alternative 5 - Complete Removal, Storage, and Off-Site Disposal**

Section 121 of CERCLA mandates that remedies must be protective of human health and the environment, utilize a permanent solution and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and be cost effective. In addition, cleanup standards for remedial actions must meet any applicable or

What is a Preliminary Risk Evaluation?

Methodology to conduct a preliminary risk evaluation is recommended by EPA in guidance documents. The preliminary risk evaluation for an interim action evaluates the most likely, rather than all possible, routes of exposure. First, the contaminants of concern are identified and the level of those contaminants determined. Second, the means by which an individual could be exposed are determined. An example would be the inhalation of airborne contaminants by a worker. Third, the location of a potentially affected individual and the amount of time the individual spends at that location have to be assumed. Generally, a range of preliminary risk evaluation scenarios is evaluated (see glossary). Fourth, the amount of the contaminant that will make it to the receptor from the source (the Pit 9 waste) is estimated. Finally, the intake or exposure received by the individual at the assumed location is compared to values known to pose risks. The excess carcinogenic and non-carcinogenic risks from the site are then determined, with risks above the recommended acceptable levels requiring cleanup.

relevant and appropriate requirements (ARARs, see glossary). For alternatives that meet these criteria, a more detailed evaluation was conducted. Aside from the "no action" alternative, the alternatives chosen above would comply with those requirements. In general, all technologies used to accomplish remedial action on a site contaminated with radionuclides will result in waste materials that require disposal or storage. The final disposal of these waste materials is the single largest problem in remedial action.

Since the resources and technology necessary to implement this interim action have not been fully identified, the initiation of this action is contingent upon the successful selection of a cost-effective technology which meets the clean-up criteria.

Alternative 1 - No Action

The Superfund program requires that the "no action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, no further action would be taken at the site to prevent exposure to radionuclide (i.e., americium and plutonium) contamination, although decay and dispersion of the radionuclides would occur over a long period of time (over 250,000 years). However, existing institutional controls would be maintained. No costs would be associated with the "no action" alternative.

Alternative 2 - In-Situ Vitrification

In-Situ Vitrification is a process in which the contaminated material is heated to its melting temperature, then is allowed to cool and solidify to a glassy mass. Vitrification is a high energy consuming process. In the In-situ Vitrification process, electricity is applied to electrodes placed in the ground over the waste mass. The ground and waste mass

heat and melt, and the melting zone grows downward. A hood to catch gases is placed over the zone, and the gases are treated or removed to prevent air pollution. Presumably, the radionuclides (i.e., americium and plutonium) would be trapped, and some radiation would be attenuated (reduced to a lower energy state) by the resulting material. The estimated cost to currently implement this alternative is approximately \$52.5 million; however, additional research and development would be necessary prior to use of this technology for the proposed application.

Alternative 3 - Ex-Situ Vitrification

Vitrification could also be performed on excavated materials on-site in an electric furnace or in a rotary kiln, both called Ex-Situ Vitrification. In the first process, the materials would be melted and poured into molds, while in the second, the contaminated materials are heated in a rotary kiln to form a solid mass. Although the second process may not necessarily produce a solid single mass, it may reduce availability of the radioactive constituent for leaching and may be more appropriate for containing radioactivity. The resulting products in either case would be returned to Pit 9. This process would be conducted in compliance with the RCRA requirements for hazardous and solid waste management, in accordance with Section 121 of CERCLA. The estimated cost to currently implement this alternative is approximately \$57 million; however, additional research and development would be necessary prior to use of this technology for the proposed application.

Alternative 4 - Chemical Extraction and/or Physical Separation

The contaminated materials requiring treatment would be removed from Pit 9 and placed into a processing unit. Cleanup criteria will be applied to determine which materials will be removed from or returned to the pit. The

removed contaminants are then treated using several chemical or physical separation methods. Physical separation uses mechanical methods such as wet or dry screening, flotation, gravity concentration, sedimentation, and filtration to separate mixtures of solids and concentrate the contaminants. Chemical separation uses chemicals to remove contaminants from the soil. The object of the separation technology is to concentrate the radioactive contaminants by chemical extraction, with the aim of thereby reducing the volume of waste for disposal. This process would be conducted in compliance with the RCRA requirements for hazardous and solid waste management, in accordance with Section 121 CERCLA. The estimated cost for this alternative is approximately \$115 million, which includes approximately \$65 million for treatment, interim storage, and off-site disposal (when it becomes available) of materials not returned to the pit.

Alternative 5 - Complete Removal, Storage, and Off-Site Disposal

This alternative would require the complete removal of all the waste and contaminated soil within Pit 9. The waste would then be placed in interim storage, pending availability of off-site disposal facilities. Off-site disposal could be considered for either temporary storage or permanent disposal. The purpose would be to limit the exposure of INEL workers and the environment to the radionuclides (i.e., americium and plutonium). A removal/packaging facility and interim storage facility would need to be provided for this alternative. The waste materials would need to be stabilized so that they may be transported more easily. This process would be conducted in compliance with the RCRA requirements for hazardous and solid waste management, in accordance with Section 121 CERCLA. The estimated cost for this alternative is approximately \$445 million, which includes approximately \$290 million required for interim storage, treatment, and off-site disposal when it becomes available.

Evaluation of Alternatives

The preferred alternative for a cleanup of Pit 9 at the INEL is Alternative 4 - Chemical Extraction and/or Physical Separation. Based on current information, this alternative would appear to provide the best balance of trade-offs among the alternatives with respect to nine criteria that EPA uses to evaluate alternatives. This section profiles the performance of the preferred alternative against the nine criteria, noting how it compares to the other alternatives under consideration. The nine remedial evaluation criteria are listed on the following page. The Evaluation of Alternatives table on page 7 evaluates each alternative based on these criteria.

Overall Protection of Human Health and the Environment

The primary objective of this interim action is to reduce exposure of workers, the public, and the environment to contaminants. Alternatives 2, 3, 4 and 5 would lower the chance of migration of contaminants, thus reducing the risk of exposure to the public and the environment. Alternatives 2, 3, 4 and 5 would also provide long-term protection to the public and the environment, since the contaminants would be removed or contained in those alternatives. Alternative 1 would not protect the public and the environment from contaminants.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Subpart E of the NCP clarifies and defines applicability, relevance, and appropriateness; adds the "to be considered" (TBC) category of guidances and advisories; and requires compliance with ARARs for various actions. The TBCs are discretionary, not mandatory, and they may be used to complement identified ARARs. All alternatives would meet applicable or relevant and appropriate requirements of Federal and State environmental laws, in accordance with Section 121 of CERCLA. The preferred alternative, and Alternatives 3 and 5, would involve the excavation and placement of waste, thus making the RCRA land disposal restrictions (LDRs) potential ARARs, since some wastes at this site were found to be RCRA-listed and RCRA-characteristic wastes, based on historical records. The listed waste residuals generated in these alternatives that are treated below the "best demonstrated available technology" (BDAT) requirements will be delisted (i.e., shown to be non-hazardous waste), and thus no longer subject to RCRA Subtitle C (hazardous waste) disposal and closure requirements. The waste residuals could then be managed in accordance with the RCRA Subtitle D (solid waste) and/or State solid waste disposal and closure requirements.

Long-term Effectiveness and Permanence

Alternative 4 provides the best long-term effectiveness and permanence since the predominant risk drivers (americium and plutonium) will be reduced to below clean-up requirements and the concentrated residuals (i.e., product) will be removed from Pit 9. Although In-Situ and Ex-Situ Vitrification have never been demonstrated commercially on materials similar to those located within Pit 9, it is anticipated that the effectiveness of Alternatives 2 and 3 would be long-term. Alternative 5 would not provide long-term effectiveness and permanence until off-site disposal facilities become available.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 4, through treatment of the americium and plutonium, best meets the criteria since it would reduce the volume of contaminated material and reduce the toxicity of treated wastes by removing, and concentrating the contaminants (i.e., product) which would then be put into interim storage for off-site disposal. Alternatives 2 and 3 would reduce the mobility, volume and toxicity of the contaminants. These alternatives through treatment would only trap, not destroy, the radioactive contaminants within the vitrified material which would then be left in place or redispersed in Pit 9; therefore, a large quantity of residuals would remain within Pit 9. Alternative 5 does not meet this criteria since the material would only be packaged and placed in interim storage, awaiting final treatment and off-site disposal.

Short-term Effectiveness

Alternative 2 provides the best overall short-term effectiveness by treating the radioactive material in place with minimum impact to the environment. This alternative also provides the best protection to the community and workers during remediation activities. Alternative 3 requires more handling of material than Alternative 2, due to the excavation occurring in Alternative 3, but less than Alternative 4, since additional treatment processes and handling of treatment residuals would be required in Alternative 4. Alternatives 2 and 3 would require building a treatment system to treat any gases that might be generated during the vitrification process. It is estimated that Alternatives 2 and 3 would achieve remedial objects within 2 and 4 years at a minimum, respectively, since they are not currently available for commercial use at this time and would require additional research and development prior to application for Pit 9. Alternatives 4 and 5 would require the

The Nine Remedial Evaluation Criteria

The nine evaluation criteria used in evaluating the five alternatives is summarized below:

Overall protection of human health and the environment addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether a remedy will meet all of the ARARs of other Federal and State environmental laws and/or justifies a waiver.

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up goals have been met.

Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.

Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until clean-up goals are achieved.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and operations and maintenance (O&M) costs, also expressed as net present worth-costs.

State acceptance reflects aspects of the preferred alternative and other alternatives that the State favors or objects to, and any specific comments regarding State ARARs or the proposed use of the waivers.

Community acceptance summarizes the public's general response to the alternatives described in the Proposed Plan, based on public comments received.

construction of a system to aid in the protection of the community and workers, and to minimize the environmental impacts from interim storage of the wastes from Pit 9. Storage of the large quantity of packaged waste in Alternative 5 could potentially pose a radiological hazard to the workers, community and environment. It is estimated that Alternative 4 would achieve the remedial objectives within 3 to 4 years. Wastes from Alternatives 4 and 5 that are destined for storage, would require 15 years, at a minimum, in interim storage before off-site disposal.

Implementability

Alternative 4 is the best alternative under the implementability criteria since similar processes have been demonstrated in field operations and have been used to remediate similar radiologically-contaminated sites. Because this technology has not been widely applied to complex mixed waste sites, Alternative 4 would include test phases which would take approximately 9 months to complete. Alternatives 2 and 3 are not currently available for commercial use, and have never been demonstrated on similar waste types as those located within Pit 9. Alternatives 3, 4 and 5 would require repeated handling of the waste, while Alternatives 4 and 5 would also require constant monitoring of an interim storage area. Storage and off-site disposal volumes in Alternative 5 would be approximately 10 to 20 times larger than those in Alternative 4. Alternative 5 is currently not implementable since there are no available off-site disposal locations for this type of waste.

Cost

The costs presented are rough estimates. Actual costs would vary based on the final design and detailed cost itemization. The cost estimates contain all expected expenses, which include design, project management, subcontract fees, storage and off-site disposal, etc. Estimated costs are shown on the Total Cost Comparison table (see page 9). Cost estimates show Alternative 2 to be the lowest cost alternative, and Alternative 5 to be the highest cost alternative. The other costs for the additional alternatives fall within that range. Capital costs and operating and maintenance costs for the five alternatives would vary from highest to lowest in the following order: 5, 4, 3, 2 and 1. The estimated cost for Alternatives 2 and 3 are based on costs for those technologies that would need to be verified in research and development prior to implementation. Alternatives 4 and 5 include interim storage and off-site disposal costs at approximately \$1,600 per cubic foot.

State Acceptance

IDHW has been involved in the preparation of this Proposed Plan and comments received have been incorporated. This Proposed Plan is issued with the concurrence of IDHW.

Community Acceptance

Community acceptance will be evaluated after receipt of comments. The Agencies seek comments on the Proposed

Evaluation of Alternatives				
	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Criteria	In-Situ Vitrification	Ex-Situ Vitrification	Chemical Extraction and/or Physical Separation	Complete Removal, Storage, and Off-Site Disposal
Long-Term Effectiveness	⊗	●	●	○
Reduction of Toxicity, Mobility, or Volume Through Treatment	⊗	●	●	○
Short-Term Effectiveness	●	●	⊗	○
Implementability	⊗	⊗	●	○
Cost	●	●	⊗	○
● = Best ● = Good ⊗ = Poor ○ = Worst				

Plan including the proposed delisting of the listed waste residuals for the Preferred Alternative and Alternative 3. The Agencies will review and consider public comments on this Proposed Plan and will incorporate comments in the decision process. The Responsiveness Summary portion of the Record of Decision for the Interim Action will provide responses to public comments. Written comments and verbal comments given at the public meeting will receive equal consideration.

Summary of the Preferred Alternative

In summary, Alternative 4 - Chemical Extraction and/or Physical Separation would achieve substantial risk reduction through treatment of the radionuclides (i.e., americium and plutonium) and by providing for the safe management of other material that will remain on-site. Alternative 4 achieves this risk reduction more quickly than any of the other alternatives, and at a substantially lower cost than Alternative 5. Therefore, the preferred alternative is believed to provide the best balance of trade-offs among alternatives with respect to the evaluation criteria. Based on the information available at this time, DOE, EPA, and IDHW believe the preferred alternative would be protective of human health and the environment, would comply with ARARs as specified in Section 121 of CERCLA, would be cost effective, and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Because it would treat the radioactive contaminants (i.e., americium and plutonium) in Pit 9, the

remedy also would meet the statutory preference for the use of a remedy that involves treatment as a principal element. If this alternative cannot be implemented, based on results of the test phases, the final action for Pit 9 remediation will be determined in the RI/FS for the TRU Contaminated Pits And Trenches (OU 7-13).

Alternative 4 would include two test phases: a Proof-Of-Process (POP) and a Limited Production Test (LPT). The test phases would be performed within the interim action for Pit 9 prior to full-scale remediation to prove the best and most cost effective technique, or combination of techniques, and will be utilized in the remedial design. Both the POP and LPT phases would involve the same processes, area, and impacts as the remediation phase, but on a smaller scale. EPA and IDHW will be involved in the review of the test design and test results, and the establishment of risk-based clean-up levels. The POP phase would use minimal equipment to prove that the proposed process(es) would be effective in treating americium and plutonium. The LPT phase would be a small-scale demonstration that all integrated systems would function as proposed, to give a high degree of confidence that all systems are reliable before full-scale remediation would begin. One of the goals of the POP and LPT is to minimize the amount of waste created. Implementation of each successive test phase would not be allowed until successful completion of the previous phase. Full-scale remediation would require characterization, retrieval, storage, and/or treatment, as necessary, to remove the americium and plutonium within Pit 9 to below clean-up levels.

Information Repositories

Additional information is contained in the Administrative Record for the interim action. Those documents can be reviewed at any of the information repositories listed below.

Library:	Hours:	Library:	Hours:
Idaho Falls Public Library 467 Broadway Idaho Falls, ID 83402 (208) 526-1450	8 a.m.-7 p.m. Mon-Thurs 8 a.m.-5 p.m. Fri 9 a.m.-1 p.m. Sat	Twin Falls Public Library 434 2nd Street East Twin Falls, ID 83301 (208) 733-2964	10 a.m.-6 p.m. Mon-Thurs 10 a.m.-5 p.m. Fri 12 p.m.-5 p.m. Sat
INEL Technical Library 1776 Science Center Drive Idaho Falls, ID 83415 (208) 526-1185	9 a.m.-9 p.m. Mon-Thurs 9 a.m.-5:30 p.m. Fri, Sat	Boise Public Library 715 South Capitol Blvd. Boise, ID 83706 (208) 384-4076	10 a.m.-6 p.m. Mon, Fri 10 a.m.-9 p.m. Tues-Thurs 1 p.m.-5 p.m. Sat
Pocatello Public Library 812 E. Clark Pocatello, ID 83201 (208) 232-1263	8 a.m.-7 p.m. Mon-Thurs 8 a.m.-5 p.m. Fri 9 a.m.-1 p.m. Sat	Moscow-Latah County Library 110 S. Jefferson Moscow, ID 83843 (208) 882-3925	10 a.m.-9 p.m. Mon, Thurs 10 a.m.-6 p.m. Tues, Wed, Fri 10 a.m.-5 p.m. Sat

Contaminated material requiring treatment would be excavated, as necessary, using specialized retrieval equipment or traditional equipment such as backhoes and front-end loaders, or a combination of such. Material retrieved from Pit 9 would be characterized and segregated for input into the selected treatment process(es) (i.e., a physical separation and/or chemical extraction unit). The treatment process(es) would result in three products: the clean material which meets the criteria for redispersion into Pit 9, the products which would contain contaminants, and the mixed-waste residuals which require interim storage awaiting off-site disposal.

A barrier will be constructed to protect the Pit 9 workers, the INEL workers, and the public from hazardous and radioactive materials. Pit 9 remediation will be accomplished in such a way that worker and public safety are not compromised. To accomplish this, all possible catastrophic events will be considered for Pit 9 remediation. These events will include both Natural Phenomena (i.e., earthquakes, high winds, flooding, and lightning) and Operational Events (i.e., fire, explosion, nuclear criticality, equipment failure, etc.). In addition to addressing possible catastrophic events, plans for handling design issues such as adequate confinement systems and contamination control will be developed to ensure that contaminants are maintained in and around Pit 9. This would prevent the spread of radioactive or hazardous contaminants to working areas or the environment during normal operation, and would be minimized if a Natural or Operational Event occurred.

The criteria for residuals returned to Pit 9, or for waste to be left in place in the pit, will reduce concentration of contaminants based on the following performance criteria (as appropriate): 1) a current industrial scenario of $\leq 10^{-4}$ for carcinogenic risk or <1 hazard index for noncarcinogenic health effects; or 2) less than BDAT requirements.

Treatment standards for contaminants presenting an unacceptable risk will be: 1) average concentrations of transuranic isotopes in residuals (i.e., treated waste streams) being returned to Pit 9 will be <10 nanocuries per gram; and 2) wastes and/or materials in Pit 9 containing ≥ 10 nanocuries per gram transuranics will be treated to reduce the volume by $>90\%$ prior to returning to the pit; and 3) for materials being treated and returned to Pit 9, all applicable ARARs will be met.

Storage and management of mixed-waste containing transuranic isotopes (i.e., product) will be accomplished in accordance with all ARARs and TBCs, until an ultimate disposal facility is identified under the TRU Contaminated Pits And Trenches (OU 7-13) ROD or the WAG-7 Comprehensive ROD. Following treatment of americium and plutonium, Pit 9 would be backfilled to above grade and sloped to encourage drainage away from the pit.

Total Cost Comparison (in thousands of dollars)

<i>Alternative</i>	<i>In-Situ Vitrification</i>	<i>Ex-Situ Vitrification</i>	<i>Chemical Extraction and/or Physical Separation</i>	<i>Complete Removal, Storage, and Off-Site Disposal</i>
Interim Activity				
Design/Characterization	\$ 3,000	\$ 4,000	\$ 0	\$ 0
Construction/Operation	24,000	15,000	0	0
Maintenance	5,000	2,500	0	0
Research and Development	3,000	5,000	0	0
Excavation/Physical Separation	0	11,500	21,000	43,393
Contingency	17,500	19,000	7,000	14,464
Subtotal	\$ 52,500	\$ 57,000	\$ 28,000	\$ 57,857
Long-term Storage and Off-Site Disposal				
Interim Storage/Treatment	\$ 0	\$ 0	\$36,172	145,313
Transport/Transport Containers	0	0	2,088	10,500
Verification	0	0	3,750	18,750
Long-term Disposal	0	0	23,138	115,688
Contingency	0	0	21,715	96,749
Subtotal	\$ 0	\$ 0	\$ 86,863	\$ 387,000
TOTAL	\$ 52,500	\$ 57,000	\$ 114,863	\$ 444,857

Public Involvement Opportunities

Public input is critical to the CERCLA process, and the Agencies encourage you to participate in the remedy selection process.

The following public involvement activities or opportunities have been, or will be, available:

Public Meeting - During the 30-day comment period, a public meeting is scheduled as listed on the last page. Verbal comments will be accepted at the meeting on the Proposed Plan.

Written Comments - Written comments are encouraged and should be addressed to Jerry Lyle at the DOE Field Office, Idaho, at the address listed on this page.

Questions - If you have questions concerning the Proposed Plan or other INEL issues, please call the INEL Community Relations Office at the phone number listed on this page.

Information Repositories - Additional information is available at the information repositories listed in the box on page 8.

The Agencies need your comments on this Proposed Plan and the Preferred Alternative presented. All comments, verbal or written, will be addressed in the Responsiveness Summary portion of the Record of Decision scheduled for early 1992.

Addresses

For submission of written comments:

Mr. Jerry Lyle, Acting
Deputy Assistant Manager
Environmental Restoration and Waste Management
Department of Energy Field Office, Idaho
785 DOE Place
Idaho Falls, ID 83401-1562

For additional information:

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INEL Community Relations Office
785 DOE Place, MS 3902
Idaho Falls, ID 83401-1562
(208) 526-6864

Mr. Wayne Pierre
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101
(206) 553-7261

Mr. Dean Nygard
State of Idaho
Department of Health and Welfare
Division of Environmental Quality
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Acronyms and Glossary

Action Plan - Document which defines the schedule and procedures for implementing the Interagency Agreement (IAG), the agreement between DOE, EPA, and IDHW implementing CERCLA at the INEL.

Administrative Record - Documents including correspondence, public comments, Record of Decision, technical reports, and others upon which the Agencies base their remedial action selection.

ARARs - (Applicable or Relevant and Appropriate Requirements) - "Applicable" requirements mean those clean-up standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. "Relevant and Appropriate" requirements mean those clean-up standards that address problems or situations sufficiently similar to

those encountered at the CERCLA site that their use is well suited to that particular site.

BDAT - (Best Demonstrated Available Technology) - "Best" is defined as that technology which offers the greatest reduction (based on a statistical analysis) of toxicity, mobility, or volume of the waste. To be "demonstrated" a treatment technology must be demonstrated to work at a full-scale level (i.e., technologies available only on a pilot- or bench-scale are not considered demonstrated). To be "available" a treatment technology must be commercially available.

CERCLA - (Comprehensive Environmental Response, Compensation, and Liability Act, commonly called Superfund, implemented by 40 CFR 300) - Act which establishes a program to identify sites where hazardous substances have been, or might be, released into the environment and to ensure that they are cleaned up.

curie - A unit of radioactivity equal to 3.7×10^{10} disintegrations per second.

HWMA - (Hazardous Waste Management Act) - Idaho's law which governs hazardous waste.

hazard index - A numerical value that represents the sum of hazard quotients, when the hazard index exceeds 1, there may be concern for potentially non-cancer effects.

interim action - Actions to remediate sites in phases using operable units as early actions to eliminate, reduce, or control the hazards posed by a site or to expedite the completion of total site cleanup.

mixed-waste - waste that contains both radioactive materials and hazardous waste as defined under 40 CFR 261.

mrem - One-thousandths of a Roentgen-equivalent-man, a unit of radiation which correlates to biological damage in the human body due to radiation.

nanocurie - One-billionth of a curie.

NCP - (National Contingency Plan, implemented by 40 CFR 300) - The basic policy directive for federal response actions under CERCLA, including the procedures and standards for responding to releases of hazardous substances.

NPL - (National Priorities List) - A list of sites designated as needing long-term remedial cleanup, whose purpose is to inform the public of the most serious hazardous waste sites in the nation.

operable unit - Separate response measures, consistent with a permanent remedy utilized to facilitate faster action at sites.

Proposed Plan - Document requesting public input on a proposed remedial alternative.

RCRA - (Resource, Conservation and Recovery Act, implemented by 40 CFR 260) - Act which defines hazardous waste and the requirements for dealing with hazardous waste.

residuals - Those wastes that have been treated and will be evaluated for return to the pit.

Responsiveness Summary - The part of the ROD (see below) which summarized significant comments received from the public and provides the Agencies an opportunity to comment "on the record".

RI/FS - (Remedial Investigation/Feasibility Study) - A document which describes the characterization of the nature and extent of contamination and the evaluation of potential remedial options.

Preliminary Risk Evaluation Scenarios - The different settings which are evaluated for risk. For example, the current hypothetical occupational scenario used in this Plan was that of an exposure frequency of 250 days per year and an exposure duration of 25 years.

ROD - (Record of Decision) - Document which is a consolidated source of information about the site, the remedy selection process, and the selected remedy for a cleanup under CERCLA. Contains the Responsiveness Summary (see above).

SARA - (Superfund Amendments and Reauthorization Act) - Act signed into law in 1986 that increases the level of public and state involvement in the CERCLA process.

Transuranium Radionuclide - Any radionuclide having an atomic number greater than 92.

Transuranic Waste - Without regard to source or form, waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. Heads of Field Elements can determine that other alpha contaminated wastes, peculiar to a specific site, must be managed as transuranic waste.

Public Comment Needed on Cleanup

DOE, EPA and IDHW are currently seeking public comment on a Proposed Plan to cleanup Pit 9 at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory. This Proposed Plan describes the alternatives considered and the alternative preferred by DOE, EPA and IDHW. The public comment period is December 13, 1991 - January 12, 1992. Written comments can be sent to Jerry Lyle at the DOE Field Office, Idaho, at the address listed on page 10. Verbal comments will be recorded at the public meeting listed below.

The public meeting on this proposed plan will be held in Idaho Falls on Tuesday, January 7, 1992, at the Westbank Inn. The meeting will begin at 6:30 pm.





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